

## DeeSel.1 Industrial Ethernet Extender Multi-Drop Unit, G-SHDSL 2-Wire, 5.7 Mbps

Get multi-drop Ethernet extension over twisted pair with distances of 4.3 miles per hop.



### Customer Support Information

Order toll-free in the U.S.: Call 877-877-BBOX (outside U.S. call 724-746-5500)  
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PA 15055-1018 • Web site: [www.blackbox.com](http://www.blackbox.com) • E-mail: [info@blackbox.com](mailto:info@blackbox.com)

TABLE OF CONTENTS

1. General Information .....9

1.1 Features .....9

1.2 Description..... 9

1.3 Power Input Connector ..... 9

2. Configuration ..... 10

2.1 Hardware (DIP-switch) Configuration .....10

2.2 DIP Switch Settings ..... 11

    DIP Switch Settings: Data Rate ..... 11

    Ethernet Management Port..... 14

3. Installation..... 16

3.1 Connecting the Interface ..... 16

3.2 Connecting the Ethernet Interface ..... 17

3.3 Connecting external AC universal power supply ..... 18

4. Operation ..... 19

4.1 Power-up ..... 19

4.2 LED Status Monitors ..... 19

    Power (Green) ..... 20

    Line Link (Green) (C1 and C2 ports)..... 20

    ETH Link (Green) ..... 20

5. Software Upgrade..... 20

A. Specifications..... 21

A.1 Line Rate .....21

A.2 Ethernet Interface .....21

A.3 Status LEDs .....21

    Power (Green) ..... 21

    Line Link (Green) (C1 and C2 ports)..... 21

    ETH Link (Green) ..... 21

A.4 Configuration .....21

A.5 Power and Power Supply Specifications .....21

A.6 Transmission Line .....22

A.7 Line Coding .....22

A.8 Line Interface .....22

A.9 Physical Connection .....22

A.10 Environment .....22

A.11 Third Party Software Licenses .....23

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B.	Interface Pinouts.....	23
B.1	Line Port (C1, C2) .....	23
B.2	Ethernet Port .....	23

**RADIO FREQUENCY INTERFERENCE STATEMENTS**

**FEDERAL COMMUNICATIONS COMMISSION AND INDUSTRY CANADA RADIO  
FREQUENCY INTERFERENCE STATEMENTS**

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

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## INSTRUCCIONES DE SEGURIDAD

### (Normas Oficiales Mexicanas Electrical Safety Statement)

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
  - A. El cable de poder o el contacto ha sido dañado; u
  - B. Objetos han caído o líquido ha sido derramado dentro del aparato; o
  - C. El aparato ha sido expuesto a la lluvia; o
  - D. El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
  - E. El aparato ha sido tirado o su cubierta ha sido dañada.

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## SAFETY WHEN WORKING WITH ELECTRICITY



- This device contains no user serviceable parts. This device can only be repaired by qualified service personnel.
- Do not open the device when the power cord is connected. For systems without a power switch and without an external power adapter, line voltages are present within the device when the power cord is connected.
- For devices with an external power adapter, the power adapter shall be a listed Limited Power Source. The mains outlet that is utilized to power the device shall be within 10 feet (3 meters) of the device, shall be easily accessible, and protected by a circuit breaker in compliance with local regulatory requirements.
- For AC powered devices, ensure that the power cable used meets all applicable standards for the country in which it is to be installed.
- For AC powered devices which have 3 conductor power plugs (L1, L2 & GND or Hot, Neutral & Safety/Protective Ground), the wall outlet (or socket) must have an earth ground.
- For DC powered devices, ensure that the interconnecting cables are rated for proper voltage, current, anticipated temperature, flammability, and mechanical serviceability.
- WAN, LAN & PSTN ports (connections) may have hazardous voltages present regardless of whether the device is powered ON or OFF. PSTN relates to interfaces such as telephone lines, FXS, FXO, DSL, xDSL, T1, E1, ISDN, Voice, etc. These are known as “hazardous network voltages” and to avoid electric shock use caution when working near these ports. When disconnecting cables for these ports, detach the far end connection first.
- Do not work on the device or connect or disconnect cables during periods of lightning activity.



In accordance with the requirements of council directive 2002/96/EC on Waste of Electrical and Electronic Equipment (WEEE), ensure that at end-of-life you separate this product from other waste and scrap and deliver to the WEEE collection system in your country for recycling.



This device contains no user serviceable parts. This device can only be repaired by qualified service personnel.



This device is **NOT** intended nor approved for connection to the PSTN. It is intended only for connection to customer premise equipment.



Electrostatic Discharge (ESD) can damage equipment and impair electrical circuitry. It occurs when electronic printed circuit cards are improperly handled and can result in complete or intermittent failures. Do the following to prevent ESD:

- Always follow ESD prevention procedures when removing and replacing cards.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to safely channel unwanted ESD voltages to ground.
- To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis.



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## 1. GENERAL INFORMATION

Thank you for your purchase of this Black Box product. This product has been thoroughly inspected and tested and is warranted for one year for parts and labor. If any questions or problems arise during installation or use of this product, contact Black Box Technical Support at **724-746-5500** or **info@Black Box.com**.

### 1.1 FEATURES

- High speed extension with speeds up to 5.696 Mbps
- Two 2-wire line connections via built-in RJ-45 ports (C1 and C2)
- Four auto 10- or 100Base-T and full or half-duplex Ethernet ports for direct connection of four Ethernet devices
- Extends Ethernet up to 3.4 miles (5.48 km) using 24 AWG/0.5mm wire (192 kbps speed) per hop
- DIN Rail mount
- -40 to 85°C operating temperature

### 1.2 DESCRIPTION

The Black Box LB532A-M Multi-Drop Ethernet Extenders are easy to use and take advantage of existing copper twisted-pair infrastructure to connect Ethernet networks or devices at high speeds over long distances. Operating over standard 0.5 mm voice-grade wiring, the LB532A-M delivers speeds up to 5.7 Mbps and extends Ethernet connections across distances ranging from 11,000 ft (2.2 miles or 3.5 km) to 18,000 ft (3.4 miles or 5.48 km) per hop. Whether you need connect to a remote offices, kiosks, guard stations, train stations, digital sensors or IP cameras—Black Box Ethernet Extenders offer the industry's optimum combination of speed and distance. Black Box Ethernet Extenders ensure hassle-free set-up and operation, while achieving the highest possible line rate for the required distance and electro-magnetic environment. The LB532A-M temperature specs allow for operation at -40 to 85°C.

### 1.3 POWER INPUT CONNECTOR

The LB532A-M comes with an external AC universal power supply. (For additional specifications and details on power and power supply, see Appendix A.5 on page 21.)

- The power connection to the LB532A-M is a terminal block
- Rated voltage: 5 VDC

- Rated current: 1 A DC

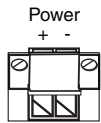


Figure 1. Terminal block power connection

- Output from power supply: 5 VDC, 1A regulated ( $\pm 5\%$ )
- Input to power supply: universal input 100–240 VAC 50/60 Hz 0.3A



**The external AC adapter shall be a listed limited power source that incorporates a disconnect device and shall be positioned within easy reach of the operator. Ensure that the AC power cable meets all applicable standards for the country in which it is to be installed, and that it is connected to a wall outlet that has earth ground.**

2. CONFIGURATION

You can configure the LB532A-M only through the hardware configuration via DIP switches.

2.1 HARDWARE (DIP-SWITCH) CONFIGURATION

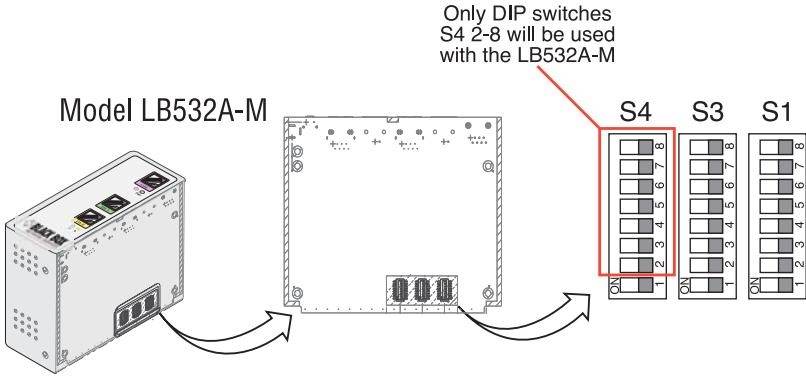
The only configurable parameter is the data rate, set by DIP switches **S4-2** through **S4-8** (see Table 2 on page 11). All other DIP switches should remain in the *OFF* position. When configuring the data rate, set the DIP switches to the desired rate before applying power to the LB532A-M.

*NOTE: Factory Default Configuration: 5.696 Mbps (DIP switches are all OFF)*

Table 1: LB532A-M configurable parameters

Parameter	Description	Possible Values
Data Rate/ Timeslots	Defines the number of timeslots. The data rate is calculated by the equation: data rate = timeslots x 64k.	1-72 timeslots

*NOTE: The default configuration for the LB532A-M is 89 timeslots (5695 kbps).*



**Figure 2.** Underside of LB532A-M showing location of DIP switches

DIP switches **S1** and **S3** must all be in the *OFF* position. DIP switch **S4**, positions 2–8 are used to configure the data rate. This figure shows the DIP switch orientation with respect to *ON* and *OFF* positions is consistent for all switches.

## 2.2 DIP SWITCH SETTINGS

Once the device is powered up and operating in DIP switch configuration mode, you cannot change configuration until you power it down again.



### DIP Switch Settings: Data Rate

Switches **S4-2** through **S4-8** define the line rate.

**Table 2:** S4-2 through S4-8 Data Rate DIP switch settings

S4-2	S4-3	S4-4	S4-5	S4-6	S4-7	S4-8	Data Rate (kbps)
OFF	OFF	OFF	OFF	OFF	OFF	ON	192
OFF	OFF	OFF	OFF	OFF	ON	OFF	256
OFF	OFF	OFF	OFF	OFF	ON	ON	320
OFF	OFF	OFF	OFF	ON	OFF	OFF	384
OFF	OFF	OFF	OFF	ON	OFF	ON	448
OFF	OFF	OFF	OFF	ON	ON	OFF	512
OFF	OFF	OFF	OFF	ON	ON	ON	576
OFF	OFF	OFF	ON	OFF	OFF	OFF	640
OFF	OFF	OFF	ON	OFF	OFF	ON	704
OFF	OFF	OFF	ON	OFF	ON	OFF	768

Table 2: S4-2 through S4-8 Data Rate DIP switch settings

S4-2	S4-3	S4-4	S4-5	S4-6	S4-7	S4-8	Data Rate (kbps)
OFF	OFF	OFF	ON	OFF	ON	ON	832
OFF	OFF	OFF	ON	ON	OFF	OFF	896
OFF	OFF	OFF	ON	ON	OFF	ON	960
OFF	OFF	OFF	ON	ON	ON	OFF	1024
OFF	OFF	OFF	ON	ON	ON	ON	1088
OFF	OFF	ON	OFF	OFF	OFF	OFF	1152
OFF	OFF	ON	OFF	OFF	OFF	ON	1216
OFF	OFF	ON	OFF	OFF	ON	OFF	1280
OFF	OFF	ON	OFF	OFF	ON	ON	1344
OFF	OFF	ON	OFF	ON	OFF	OFF	1408
OFF	OFF	ON	OFF	ON	OFF	ON	1472
OFF	OFF	ON	OFF	ON	ON	OFF	1536
OFF	OFF	ON	OFF	ON	ON	ON	1600
OFF	OFF	ON	ON	OFF	OFF	OFF	1664
OFF	OFF	ON	ON	OFF	OFF	ON	1728
OFF	OFF	ON	ON	OFF	ON	OFF	1792
OFF	OFF	ON	ON	OFF	ON	ON	1856
OFF	OFF	ON	ON	ON	OFF	OFF	1920
OFF	OFF	ON	ON	ON	OFF	ON	1984
OFF	OFF	ON	ON	ON	ON	OFF	2048
OFF	OFF	ON	ON	ON	ON	ON	2112
OFF	ON	OFF	OFF	OFF	OFF	OFF	2176
OFF	ON	OFF	OFF	OFF	OFF	ON	2240
OFF	ON	OFF	OFF	OFF	ON	OFF	2304
OFF	ON	OFF	OFF	OFF	ON	ON	2368
OFF	ON	OFF	OFF	ON	OFF	OFF	2432
OFF	ON	OFF	OFF	ON	OFF	ON	2496
OFF	ON	OFF	OFF	ON	ON	OFF	2560
OFF	ON	OFF	OFF	ON	ON	ON	2624
OFF	ON	OFF	ON	OFF	OFF	OFF	2688
OFF	ON	OFF	ON	OFF	OFF	ON	2752
OFF	ON	OFF	ON	OFF	ON	OFF	2816
OFF	ON	OFF	ON	OFF	ON	ON	2880
OFF	ON	OFF	ON	ON	OFF	OFF	2944
OFF	ON	OFF	ON	ON	OFF	ON	3008

**Table 2:** S4-2 through S4-8 Data Rate DIP switch settings

S4-2	S4-3	S4-4	S4-5	S4-6	S4-7	S4-8	Data Rate (kbps)
OFF	ON	OFF	ON	ON	ON	OFF	3072
OFF	ON	OFF	ON	ON	ON	ON	3136
OFF	ON	ON	OFF	OFF	OFF	OFF	3200
OFF	ON	ON	OFF	OFF	OFF	ON	3264
OFF	ON	ON	OFF	OFF	ON	OFF	3328
OFF	ON	ON	OFF	OFF	ON	ON	3392
OFF	ON	ON	OFF	ON	OFF	OFF	3456
OFF	ON	ON	OFF	ON	OFF	ON	3520
OFF	ON	ON	OFF	ON	ON	OFF	3584
OFF	ON	ON	OFF	ON	ON	ON	3648
OFF	ON	ON	ON	OFF	OFF	OFF	3712
OFF	ON	ON	ON	OFF	OFF	ON	3776
OFF	ON	ON	ON	OFF	ON	OFF	3840
OFF	ON	ON	ON	OFF	ON	ON	3904
OFF	ON	ON	ON	ON	OFF	OFF	3968
OFF	ON	ON	ON	ON	OFF	ON	4032
OFF	ON	ON	ON	ON	ON	OFF	4096
OFF	ON	ON	ON	ON	ON	ON	4160
ON	OFF	OFF	OFF	OFF	OFF	OFF	4224
ON	OFF	OFF	OFF	OFF	OFF	ON	4288
ON	OFF	OFF	OFF	OFF	ON	OFF	4352
ON	OFF	OFF	OFF	OFF	ON	ON	4416
ON	OFF	OFF	OFF	ON	OFF	OFF	4480
ON	OFF	OFF	OFF	ON	OFF	ON	4544
ON	OFF	OFF	OFF	ON	ON	OFF	4608
ON	OFF	OFF	OFF	ON	ON	ON	4672
ON	OFF	OFF	ON	OFF	OFF	OFF	4736
ON	OFF	OFF	ON	OFF	OFF	ON	4800
ON	OFF	OFF	ON	OFF	ON	OFF	4864
ON	OFF	OFF	ON	OFF	ON	ON	4928
ON	OFF	OFF	ON	ON	OFF	OFF	4992
ON	OFF	OFF	ON	ON	OFF	ON	5056
ON	OFF	OFF	ON	ON	ON	OFF	5120
ON	OFF	OFF	ON	ON	ON	ON	5184

Table 2: S4-2 through S4-8 Data Rate DIP switch settings

S4-2	S4-3	S4-4	S4-5	S4-6	S4-7	S4-8	Data Rate (kbps)
ON	OFF	ON	OFF	OFF	OFF	OFF	5248
ON	OFF	ON	OFF	OFF	OFF	ON	5312
ON	OFF	ON	OFF	OFF	ON	OFF	5376
ON	OFF	ON	OFF	OFF	ON	ON	5440
ON	OFF	ON	OFF	ON	OFF	OFF	5504
ON	OFF	ON	OFF	ON	OFF	ON	5568
ON	OFF	ON	OFF	ON	ON	OFF	5632
ON	OFF	ON	OFF	ON	ON	ON	5696

Ethernet Management Port

The LB532A-M offers a 10/100 Ethernet port to view the current DIP switch settings via Telnet sessions. The Ethernet interface default IP address is 192.168.200.1. Log into the LB532A-M management port using the password *superuser*.

Through the Ethernet management port, the following variables can be configured or monitored:

- **status:** Shows the general configuration and status of the unit
- **info:** Shows system information
- **upgrade:** Enables the system upgrade prompt

**Line Status Command.** The status command shows the following line status information: sync state, link state, link speed, error counters, line condition, noise margin, and test mode status.

The following status information is available through the Command Line Interface:

- **sync state:** *Out of Sync, Acquiring Sync, In Sync, or Losing Sync*
- **link state:** *In Progress, Success, Deactivated, or Idle*

**NOTE: Link State vs. Sync State**—The **Link State** describes whether the line is training (in progress), linked (success), deactivated (we don’t have an option to deactivate the modem, so the user should not see this), or idle.

**NOTE:** The **Sync State** describes whether no sync words have been found (out of sync), there are no sync word errors (in sync), or whether we are transitioning from out of sync to in sync (acquiring sync) or vice versa (losing sync). Typically, when the link is training, the sync state goes from out of sync to acquiring sync to in sync.

- **actual rate:** The actual rate at which the link is running (minus overhead).
- **noise margin:** The maximum tolerable increase in external noise power that still allows for BER of less than  $1 \times 10^{-7}$ .
- **error counters:** The following error counters are available: CRC and LOSW (Loss of Sync Word)

**Help Commands.** The following commands are provided to help the user find the correct command:

- **help:** Lists all the commands that the console recognizes

**Example Command Line Interface Session.**

```
LB532A-M Command Shell
Password:
LB532A-M> status
c1:
configuration:
    link mode:      remote
    link rate:      5696
    line probe:     disabled
status:
    actual rate:    0
    loss of signal: unavailable
    noise margin:   0
    snr:            0
    sync state:     out of sync
    link state:     idle
    power scale:    0dB
error counters:
    crc:            0
    losw:           0
c2:

configuration:
    link mode:      local
    link rate:      5696
    line probe:     disabled
status:
    actual rate:    0
    loss of signal: unavailable
    noise margin:   0
    snr:            0
    sync state:     out of sync
    link state:     idle
    power scale:    0dB
```

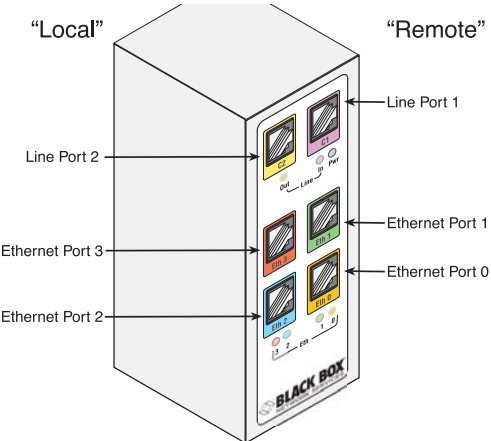
```
error counters:
  crc:          0
  losw:         0

LB532A-M> exit
```

*NOTE: The line probe feature is a future product enhancement.*

**3. INSTALLATION**

Once the LB532A-M is properly configured, it is ready to connect to the line interface and to the power source. This section explains how to make these connections.



**Figure 3.** LB532A-M front panel connectors

**3.1 CONNECTING THE INTERFACE**

The LB532A-M supports communication between two DTE devices using 24 AWG (0.5 mm) wire up to:

- 18,000 feet (3.4 miles or 5.48 km) at 192 kbps per hop
- 11,000 feet (2.2 miles or 3.5 km) at 5696 kbps per hop

Two things are essential:

1. These units work in pairs with any LB532A-L, LB532A-R, LB512A-L or LB512A-R model. Every local line port should connect to a remote line port.



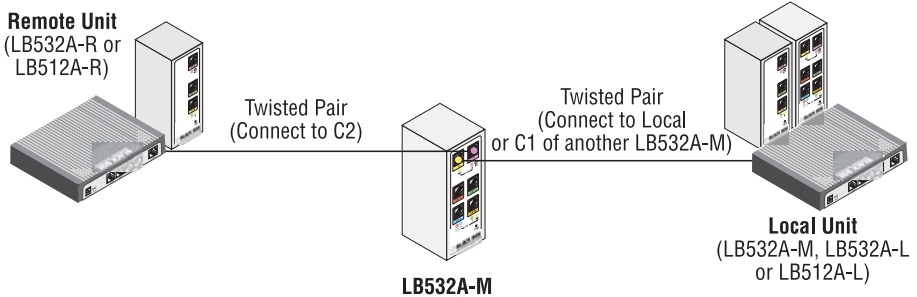


Figure 4. Local to remote connection

- To function properly, the LB532A-M needs one twisted pair of metallic wire. This twisted pair must be unconditioned, dry, metallic wire, between 19 (0.9mm) and 26 AWG (0.4mm) (the higher number gauges will limit distance). Standard dial-up telephone circuits, or leased circuits that run through signal equalization equipment, or standard, flat modular telephone type cable, are not acceptable.

The RJ-45 line connector on the LB532A-M's twisted pair interface is polarity insensitive and is wired for a two-wire interface.

### 3.2 CONNECTING THE ETHERNET INTERFACE

This section describes how to connect the Ethernet ports to your network equipment.



**The interconnecting cables shall be acceptable for external use and shall be rated for the proper application with respect to voltage, current, anticipated temperature, flammability, and mechanical serviceability.**

The RJ-45 ports labeled Ethernet are the Auto-MDIX 10/100Base-T interface. These ports are designed to connect directly to a 10/100Base-T device or network. You may connect these ports to a hub or PC using a straight through or crossover cable that is up to 328 ft long.

3.3 CONNECTING EXTERNAL AC UNIVERSAL POWER SUPPLY

The LB532A-M is equipped with the terminal block power connection already on the unit (see Figure 5). For additional information only, see Figure 6 for details on how to install the power supply.

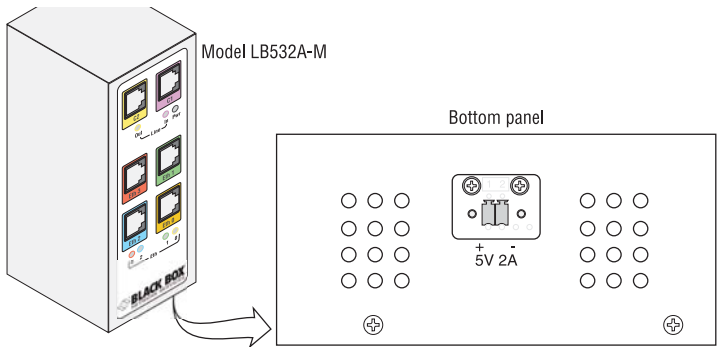


Figure 5. LB532A-M bottom panel power connector

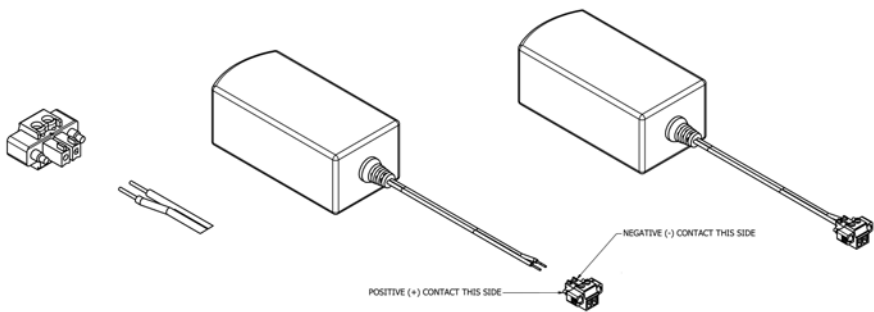


Figure 6. Power supply installation

To connect the AC power supply, determine the positive lead and negative lead on the power adapter. Insert the positive lead into the opening on the terminal block labeled + and the negative lead into the opening on the terminal block labeled -. Tighten the screws on the block to secure the wires. The LB532A-M powers up as soon as it is connected to an AC power source—there is no power switch.



The external AC adaptor shall be a listed limited power source that incorporates a disconnect device and shall be positioned within easy reach of the operator. Ensure that the AC power cable meets all applicable standards for the country in which it is to be installed, and that it is connected to a wall outlet that has earth ground.

4. OPERATION

Once the LB532A-M is properly configured and installed, it should operate transparently. The following sections describe power-up, reading the LED status monitors, and using the built-in loopback test modes.

4.1 POWER-UP

To apply power to the LB532A-M, first be sure that you have read section 1.3, “Power Input Connector” on page 9, and that the unit is connected to the appropriate power source. Power up the unit.

4.2 LED STATUS MONITORS

There are four LEDs that provide feedback on the state of the unit. Figure 7 shows the location of the front panel LEDs.

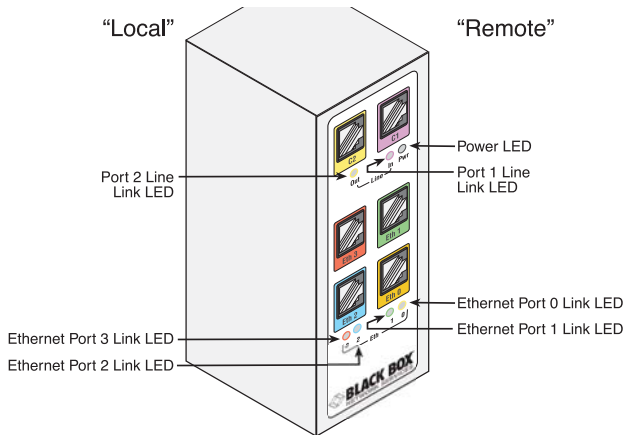


Figure 7. LB532A-M front panel LEDs

### Power (Green)

The Power LED glows solid during normal operation. At startup, during the POST, the LED blinks once every second. If the POST fails, the unit does not enter normal operation, and the LED blinks once every 0.4 seconds.

### Line Link (Green) (C1 and C2 ports)

On both C1 and C2 ports, the Line LED glows solid while a link is established. While the link is training, it blinks once every second.

### ETH Link (Green)

The Ethernet Link LEDs show that there is an active physical connection to the console, or an active physical connection to an Ethernet device.

## 5. SOFTWARE UPGRADE

The software upgrade feature is available through TFTP. The software upgrade takes approximately 1 to 2 minutes to complete. To upgrade the software:

1. Connect to the LB532A-M via the Ethernet management port and a Telnet session at 192.168.200.1.
2. Enter the upgrade **<TFTP server IP address>:./<filename>** command to begin the upgrade.

After approximately 1 to 2 minutes, the LB532A-M will operate with the upgraded software.

## **A. SPECIFICATIONS**

### **A.1 LINE RATE**

192 to 5696 kbps (64k increments; 3-89 timeslots)

### **A.2 ETHERNET INTERFACE**

Four RJ-45, 10/100Base-T, IEEE 802.3 Ethernet

### **A.3 STATUS LEDS**

#### **Power (Green)**

The Power LED glows solid during normal operation. At startup, during the POST, the LED blinks once every second. If the POST fails, the unit does not enter normal operation, and the LED blinks once every 0.4 seconds.

#### **Line Link (Green) (C1 and C2 ports)**

On both C1 and C2 ports, the Line LED glows solid while a link is established. While the link is training, it blinks once every second.

#### **ETH Link (Green)**

The Ethernet Link LEDs show that there is an active physical network connection to the Console or an Ethernet device.

### **A.4 CONFIGURATION**

Configuration is done only with externally accessible DIP switches.

*NOTE: Factory Default Configuration: 5.696 Mbps (DIP switches are all OFF)*

### **A.5 POWER AND POWER SUPPLY SPECIFICATIONS**

The LB532A-M comes with an external universal AC power supply.

- The power connection to the LB532A-M is a terminal block (see Figure 8 on page 22)
- There is one fuse in the equipment rated at 250V, 500 mA, 2 sec.
- Rated voltage: 5 VDC

- Rated current: 1 A DC

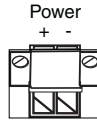


Figure 8. Terminal block power connection



**The external AC adapter shall be a listed limited power source that incorporates a disconnect device and shall be positioned within easy reach of the operator. Ensure that the AC power cable meets all applicable standards for the country in which it is to be installed, and that it is connected to a wall outlet that has earth ground.**

- Output from power supply: 5 VDC, 1A, regulated ( $\pm 5\%$ )
- Input to power supply: universal input 100–240 VAC 50/60 Hz 0.3A

### A.6 TRANSMISSION LINE

Single Twisted Pair

### A.7 LINE CODING

TC-PAM (Trellis Coded Pulse Amplitude Modulation)

### A.8 LINE INTERFACE

Transformer coupled, 2500 Vrms isolation

### A.9 PHYSICAL CONNECTION

Two RJ-45 ports, 2-wire polarity insensitive pins 4 and 5

### A.10 ENVIRONMENT

**Operating temp:** -40 to 185°F (-40 to 85°C)

**Relative Humidity:** 8 to 90% non-condensing

**Altitude:** 0 to 15,000 feet (0 to 4,600 meters)

A.11 THIRD PARTY SOFTWARE LICENSES

NOTE: The LB532A-M includes software developed under third party licenses.

B. INTERFACE PINOUTS

B.1 LINE PORT (C1, C2)

Table 3: RJ-45 connector

Pin	Signal
1	N/C
2	N/C
3	N/C
4	Tip
5	Ring
6	N/C
7	N/C
8	N/C

NOTE: N/C is “no connection.” Although denoted as Tip and Ring, the line ports are **not** polarity sensitive.

B.2 ETHERNET PORT

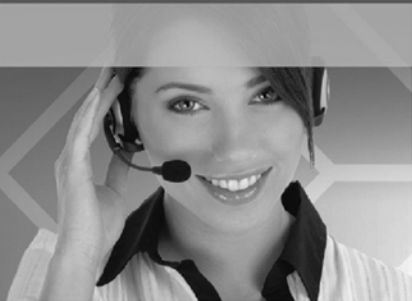
Table 4: RJ-45 socket 10/100Base-T

Pin	Signal
1	TX+
2	TX-
3	RX+
6	RX-

NOTE: Pins not listed are not used.

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